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is one sentence of eighty-five words (p. 23). There is no doubt that the work is in every way one of great value to students.

A. J. MOSES.

SCIENTIFIC JOURNALS.

THE ASTROPHYSICAL JOURNAL, JUNE.

The Measurement of Some Standard Wave-Length in the Infra-red Spectra of the Elements: EXUM PERCIVAL LEWIS.

In a review of the previous work in this field, the writer shows that very little has been done toward the identification and accurate measurement of lines due to the elements in the infra-red, and that the means employed have been comparatively crude. In the present investigation, a grating of high dispersive power was combined with the radiomicrometer, which was found to be more reliable and of greater sensitiveness than the bolometer. Results are given for sodium, lithium, silver and calcium lines.

On the Distribution in Latitude of Solar Phenomena Observed at the Royal Observatory of the Roman College in 1894: P. TACCHINI.

The faculae and spots of 1894, and especially the prominences, have been markedly more frequent in the southern hemisphere, like similar phenomena since the summer of 1892.

A Review of the Spectroscopic Observations of Mars. W. W. CAMPBELL.

The writer replies to some critics of his former paper on the spectrum of Mars, and makes a critical examination of previous work along this line. He concludes that many of the former observations were made under circumstances extremely unfavorable, and that between the different sets of results there is not a satisfactory close agreement.

Preliminary Table of Solar Spectrum Wave-Lengths. VI. H. A. ROWLAND.

The table is continued from λ 4674.648 to λ 4903.502.

On the Electromagnetic Nature of the Solar Radiation and on a New Determination of the Temperature of the Sun. H. EBERT.

A comparison of the form of the solar energy curve with that of a strongly damped electric oscillator shows that in sunlight we are dealing with electromagnetic vibrations. But with respect to electromagnetic radiation the principal mass of the Sun acts like a black body. Hence, applying Rubens' formula for the maximum energy of the radiation of blackened bodies, $\lambda \sqrt{T} = 123$, and using 0.6μ for the value of λ as found by Langley for the maximum energy of the solar spectrum, a temperature of $40,000^\circ$ C. is found for the more interior regions of the Sun. This is in good agreement with values previously determined by other methods.

Photographs of the Milky-Way near 15 Monoceros and near ϵ Cygni: E. E. BARNARD.

On the Limit of Visibility of Fine Lines in a Telescope: ALBERT A. MICHELSON.

A theoretical discussion proves that a line subtending an angle of one-fiftieth of the limit of resolution may be distinctly seen. This is verified by experiment and applied to the 'canals' on Mars. Supposing them to be quite dark, and distinguishable by an objective of not less than eighteen inches aperture, their width is calculated to be about one mile.

Conditions affecting the Form of Lines in the Spectrum of Saturn: JAMES E. KEELER.

The effects of instrumental displacements are considered, limiting the question to the case where the slit is parallel to the major axis of the ring.

A displacement of the image at right angles to the slit gives a disproportionate exposure to the middle parts of the lines, but unless the displacement exceeds one-fourth the semi-axis minor, there is scarcely any change in direction produced. A drift in the direction of the slit broadens the

lines uniformly. In every case, displacements tend to make the spectra of the ansæ parallel to the undisplaced lines of the comparison spectrum.

MINOR CONTRIBUTIONS AND NOTES.

Notes on Schmidt's Theory of the Sun.

Note on the Yerkes Observatory.

On the Presence of Helium in Clévêite.

Note on the Huggins Method of Photographing the Solar Corona without an Eclipse.

On the Cause of Granulation of the Surface of the Sun.

The illustrations of special interest are the two plates accompanying Professor Barnard's article, and a photographic reproduction of a water-color sketch of the Yerkes Observatory as it will appear when finished.

THE AMERICAN NATURALIST.

THE number for June opens with an article by Professor E. H. Barbour, of the University of Nebraska, on *Dæmonelix*, or the 'Devil's Corkscrew,' described by him in 1892. It is a reply to Dr. Theodor Fuchs, who has argued that this curious fossil is the burrow of a Miocene rodent. Professor Barbour holds that this is impossible, owing to the fact that the 'Bad Lands,' in which the fossils occur, are not wind deposits but water deposits, and for other reasons that he adduces. Dr. T. H. Montgomery in an article *On Successive Protandric and Proterogynic Hermaphroditism in Animals*, with a bibliography of 48 titles, concludes that hermaphroditism has been evolved out of the female state in all proterogynic forms, but that in the case of protandric forms it has been superimposed on the male sex. Articles follow by Dr. Joseph F. James on *Sponges, Recent and Fossil*, and by Mr. V. L. Kellogg on *The Mouth Parts of Lepidoptera*, both articles being illustrated. Dr. James points out the wide distribution of sponges in time and space, and, quoting from Sollas similarities in apparently unrelated families, concludes that forms now supposed to be

genetically related may have been of distinct origin. Mr. Kellogg argues that the commonly accepted view that the mouth parts of the Lepidoptera are of a type adapted for sucking and that mandibles are wanting or rudimentary is not true without qualification. More than half of the number is occupied with notes and reviews on the progress of the several natural sciences.

NEW BOOKS.

Leitfaden für Histologische Untersuchungen. BERNHARD RAWITZ. Jena, Gustav Fischer. 1895. Pp. xiii+148. M. 3.

Pflanzen Physiologische Praktikum. W. DETMER. Jena, Gustav Fischer. 1895. Pp. xvi+456. M. 9.

Untersuchungen über die Stärkekörner. ARTHUR MAYER. Jena, Gustav Fischer. 1895. Pp. xvi+318. M. 20.

Ueber die Auslese in der Erdgeschichte. JOHANNES WALTHER. Jena, Gustav Fischer. 1895. Pp. 36. 80 Pt..

Die Emancipation in der Ehe. FELICIE EWART. Hamburg and Leipzig, Leopold Voss. 1895. Pp. 75. M. 1.

Chinook Texts. FRANZ BOAS. Washington. 1894. Pp. 278.

A Text-Book of Zoögeography. FRANK E. BEDDARD. Cambridge, University Press. New York, Macmillan & Co. 1895. Pp. 8+246. \$1.60.

The Natural History of Aquatic Insects. L. C. MIALL. London and New York, Macmillan & Co. 1895. Pp. ix+395. \$1.75.

Electricity up to Date. JOHN B. VERITY. London and New York, Frederick Warne & Co. 1893. xii+226. 75 cents.

Algebra for Beginners. By H. S. HALL and S. R. KNIGHT. Revised by Frank L. Sevenoak. New York, Macmillan & Co. 1895. Pp. viii+180. 60 cents.

Report of the Secretary of Agriculture. Washington, D. C. 1895. Pp. 220.